ENHANCING SUSTAINABLE AWARENESS VIA SSYS CONGRESS:

CHALLENGES AND OPPORTUNITIES OF E-PLATFORMS

TO PROMOTE VALUES-BASED EDUCATION

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ABSTRACT

Constructivist student-centred learning incorporating digital learning tools has gained attention among Millennial Generation/Gen Y who will soon take over the roles of Gen X to dictate the future of web. If well guided with exposure of sustainable awareness via blended learning, Gen Y should be independent with enhanced values/thinking skills. This paper reports on the authors' initiative to connect the world by introducing the biennially held 'Search for SEAMEO Young Scientists' (SSYS) congress through e-platforms. The first author was tasked to organize a forum that was also broadcasted through web-conferencing tools with topics related to SSYS congress theme 'Disaster Risk Reduction (DRR) for Sustainable Development'. SSYS was conducted through organizing congresses as platforms for exchange among SEAMEO student and teacher delegates in face-to-face mode. But due to distance constraint, the second author was invited as third forum speaker using e-platforms and video conferencing tools including 'Facebook, webinar and skype' as the pioneering initiative. Survey questionnaires (in off-/on-line versions) were distributed to elicit the understanding of SSYS delegates and on-line respondents about various concepts of '*Interactive technology for sustainable living*'. This article reports the piloting of survey and reporting e-mode of delivering SSYS forum including qualitative analysis on survey findings of the participants' 'Attitudes Towards Use of Technology to Enhance Sustainable Living' (ATUTESL). Generally the interviewees expressed their positive attitude towards e-learning tools. The implications of study will be deliberated with suggestions of future research to enhance values and thinking skills of younger generation. (243 words)

KEYWORDS: E-Learning in Conventional Settings, Student-Centered Learning, Online Community, Sustainable Awareness, Values-Based Education

INTRODUCTION

In the recent years, constructivist student-centered learning integrating Information and Communication Technology (ICT) tools has gained increasing attention among Millennial Generation or Gen Y (born between 1980s to late 1990s) who very soon should be taking over the roles of Gen X (born between 1960s to early 1980s) to dictate the future of the web. However, literature revealed that the body of knowledge present in this scientific era caters to information regarding science and technology, societal issues and political agendas are more often aimed only at development of the cognitive domain. Student performances through oral assessment, tests and projects are well embodied in the cognitive sense within the scientific context. Areas that cover the affective domain have taken a back seat and social illnesses with new diseases are on the rise. The lack of content in values education and time constraints have more often caused the lack

of emphasis on values-based education. Another contributing factor to the forgotten focus in the affective domain is due to the fact that the focus of policy makers is more on content knowledge in the rapid development of science and technology in society rather than to promote values-based education. The emphasis on values education can happen only if both policy makers and curriculum developers work together. Hence, educators face a dilemma of implementing value-based education in a packed academic curricular framework.

This paper reports on the authors' initiative to connect the world by introducing the biennially held 'Search for SEAMEO Young Scientists' (SSYS) congress through e-learning platforms to promote values-based education. The first author was tasked to organize a forum in conjunction with SSYS congress that was also broadcasted through web-conferencing tools to provide input on topics in line with the congress theme '*Disaster Risk Reduction (DRR) for sustainable development*'. The second author was invited as forum speaker to deliver on topic '*Human factor during the impact of natural disaster: Reflective perspectives*' using e-platforms and video conferencing tools as the pioneering initiative for SSYS congress that was normally attended by SEAMEO student and teacher delegates in normal face-to-face mode.

Objectives and Focus Areas

The objectives of this study that guided the focus of research activities are:

- To explore the ways, challenges and opportunities to connect the world with the organizer of the biennially held event SSYS congress via e-Learning platforms;

- To showcase the blended mode of organizing SSYS congress incorporating values-based education in line with the congress theme;

- To report on cases of Generation X and Y respondents' attitudes towards use of digital tool to promote values-based awareness and skills for sustainable living.

The following section reviews literature including framework of study that guide the direction of research using mixed-research methods (Johnson & Onwuegbuzie, 2004).

REVIEW OF LITERATURE

Blended Learning in Conventional Settings: Challenges and Opportunities

Research showed that constructivist problem-solving curriculum through situated learning or shared cognition guided by adults as More Knowledgeable Others (MKO)(Larkin, 2002) and capable peers in Community of Practice (CoP) was found to be effective by educators/ researchers. In the advent of digital era, this type of CoP can be more effective if facilitated via e-platforms that include both digital and non-digital or face-to-face conventional settings. The study by Crawford, Krajcik & Marx (1999) revealed that CoP with desirable environment could provide opportunities for students to engage collaboratively in solving contextual problems when faced with scenarios. In the CoP possibly facilitated through e-platforms, learners and stakeholders connected for various reasons to interpret, reflect, and negotiate meaning in an open process through meaningful interactions in the community (Wenger, 2000).

Realizing that developing scientific skills, values, attitudes and infrastructure is the first step towards improving the nation's ability to use science and technology to promote ESD (Sawahel, 2007), emphasis was placed by many aspiring institutions to promote ESD through inquiry/problem-based science education. Among the ways of developing public

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understanding on sustainability included alternative strategies initiated by various institutions with evidences to support sound succession planning (Workforce, 2013) of activities with various challenges and blended mode opportunities. An example is the 'Search for SEAMEO Young Scientist' (SSYS) congress that was initiated by the Regional Centre for Science and Mathematics Education (RECSAM) in 1997 with the main objectives to 'promote scientific attitudes, awareness, provide a forum/platform for exchange of ideas and experiences' among youths/students in SEAMEO member countries. SSYS serves as platform for 'training and reorientation of pedagogical approaches' using student-centred blended mode Project-based Activities (PBA) and Problem-based Learning (PBL). Since the inception of SSYS, this Centre's visionary programme was held biennially at regional level with ESD related sub-themes from 1997 to 2002. The success of the first congress in 1997 (theme on conserving environment) had spearheaded the subsequent events in line with the themes to promote 'Science, Technology, Environment, Society' (STES) education. Values-based research projects with ESD related main themes integrating Technology Education were also set for SSYS congresses from 2004 to 2014 in accordance to the philosophy of Decade of ESD (2005-2014)(UNESCO, 2003) to enhance the Centre's visibility as stakeholder of the Regional Centre of Expertise (RCE)(UNU-IAS, 2013) since 2008.

Enhancing Awareness on Sustainable Living via Values-Based Education

Forums/networking sessions (Ng, 2006) were also introduced in SSYS as part of the initiative to promote values-based awareness on sustainable living in line with the congress themes that stimulate students' creative thinking skills. For example, during the fifth SSYS congress in 2006 with the theme 'Sustainable development (SD) for a better world', the 'important concepts of SD, the current sustainability scenario, values and practices for SD, why scientists and technologies are important to achieve SD, research on graduate students' learning to be scientists, and so forth' were introduced (Ng, 2006). The affective domain of education is responsible for bringing in awareness, changes in attitudes and values in students. Many educators have repeatedly in their work emphasized on the affective domain such as Daryl Macer from the UNESCO (Macer, 1994), Dr Jumsai the Director of the Institute of Sathya Sai Education in Thailand, Dr Margaret Taplin from Hong Kong Institute of values education and many others from the UNESCO, UNHABITAT and world bodies (UNHABITAT & ADB 2003; UNHABITAT & Global Dharma Centre, 2005; UNHABITAT & SEAMEO, 2007). These new changes associated in society have made a deep impact on hearts of educators who regard values education as a necessity.

The SEAMEO - UN-HABITAT cooperative project on Promoting 'Human Values-based Water, Sanitation and Hygiene Education' (HVWSHE) in Southeast Asian Schools was initiated by SEAMEO Secretariat to contribute towards addressing two of the Millennium Development Goals (MDGs) set by the United Nations, namely Goal 5 and Goal 7 (Dzikus, 2007; Ng, et al., 2008). Water and Values Education (WAVE)(SEAMEO Secretariat, 2007) is an innovative approach that not only seeks to impart information on water, sanitation and hygiene but also inspires and motivates learners to change their behaviour towards sustainable water-use ethic. The curriculum framework of HVWSHE is a philosophical foundation of values education that is built upon a commitment to five basic human values, namely Right Conduct, Peace, Truth, Love and Non-Violence. All the five values cannot be taught but has to be elicited from the students through the curriculum. For example, when science is taught, teachers must discuss the importance of cooperation and unity among people to serve and uplift society. If students focus on the scientific content both ethics and values must go together. Students are taught the chemical formula of water and how water is formed. Students are also given information about the inherent value that water has, also other negative implication related to water such as diseases, pollution and disaster.

Students can think about the answers and teachers are then able to facilitate a discussion. Most integrated lessons take multidisciplinary approaches (Jumsai, 2003). Some of the practices for sustainable living where water issues are concerned include ceiling on desires of using water as a luxury item, how to conserve and preserve water to prevent pollution and disasters. Issues with urbanization and the availability of fresh water as well as the misuse must be highlighted to students. Here the value and knowledge of the availability of water is important. Unless students feel that they are the future stakeholders of land, water and air they would not feel the responsibility of valuing water throughout their education. Practising right conduct by making sure they learn to save and preserve water by checking on water loss in their daily living activities and updating themselves with issues of water in societies they live in does have a significant impact on their lives. An area that is missing in students' subjects is issues of water in their local contexts. Do students know of the water catchment areas where they live in and how much access they have to water in their own areas? They need to discuss cleanliness and water treatment procedures in classrooms so that the quality of water safe for drinking is kept for survival purposes.

METHODOLOGY AND DATA ANALYSIS

Prior to the biennially held event the 9th SSYS congress [http://www.recsam.edu. my/ssys], a survey questionnaire (both available in off-/on-line versions) was distributed to elicit the understanding of SSYS delegates and on-line respondents about the concepts of '*Interactive technology: Its functions and challenges*'.

Developing/Piloting Survey to Evaluate Attitude towards Use of Technology

This survey questionnaire with a total of 36 items was developed to measure 'Attitudes Towards Use of Technology to Enhance Sustainable Living' (ATUTESL) (Ng, Chockalingam & Thien, 2014). ATUTESL was drafted based on the objectives or focus of study, aiming at eliciting the respondents' perceived level of perception on use of digital tools related to the aspects of Resource usefulness (RU), Responsive feedback (RF), Interface features (IF), User friendliness (UF) and User gratification (UG). The instrument was constructed with the 4-point Likert scale format, indicating 1=Strongly Disagree, 2=Disagree, 3=Agree and 4=Strongly Agree for the evaluation on the level of perception. Rasch partial credit model with WINSTEP computer software was used to analyze the data. The instrument was piloted in February, one month before it was administered during the 9th SSYS with the congress theme 'Disaster Risk Reduction for Sustainable Development'. Figure 1 shows the event page created in FB to invite participation through video conferencing tools.

Figure 1: SSYS Forum Page Created in FB https://www.facebook.com/events/1401275593457278/]

to Invite Participation through Video Conferencing Tools

Table 1 shows the item reliability that is 0.72. The results indicated some items fail to lie within the acceptable range of 0.4 to 1.6 recommended by Linacre and Wright (1994). In relation to this, the wordings of Item RU1, RU2, RU3, RF4, RF5, RF6 were reviewed/refined prior to administering ATUTESL in the 9th SSYS congress.

Table 1: Summary of 29 Measured Items

	Total			Model	Infit		Outfit	
	Score	Count	Measure	Error	MNSQ	ZSTD	MNSQ	ZSTD
MEAN	82.4	29.0	.00	.45	.95	-.2	.99	-.1
S.D.	5.4	.0	.91	.06	.44	1.3	.61	1.4
MAX.	88.0	29.0	1.88	.63	1.98	2.5	2.49	2.9
MIN.	57.0	29.0	-1.43	.35	.31	-2.3	.18	-2.3
Real RMSE	.49	True SD	.77	Separation	1.56	Item Reliability		.71
Model RMSE	.46	True SD	.79	Separation	1.73	Item Reliability		.75
S.E. OF ITEM MEAN = .17								

Connecting the World with SSYS Event via Blended Learning Platforms

The SSYS event was conducted through organization of congresses as platforms for exchange among SEAMEO student and teacher delegates normally in conventional educational settings using face-to-face mode. During the 9th SSYS congress, the first author was again tasked to organize a forum in line with the congress theme 'Disaster Risk Reduction (DRR) for sustainable development'. It was also broadcasted through web-conferencing tools to promote Education for All (EFA). Three main topics in conjunction with the congress were 'Impacts of Disasters and Disaster Risk Management in Malaysia; Tsunami and Earthquake: Causes, Effect and Mitigation and Human factor during the impact of natural disaster: Reflective Perspectives'.

The first two topics were delivered by two university professors in School of Humanity and School of Physics respectively with further information e.g. abstracts accessible from FB [https://www.facebook.com/events/ 1401275593457278/]. Due to the distance constraint of the third forum speaker who lives in capital city and is also the second author of this paper, blended learning platforms were leveraged to deliver the third topic (Figure *2*) including the use of video conferencing tools such as 'FB social networking site, webinar (Figure 3) and skype (Figure 4)' as pioneering initiative to connect the world through Open, Distance and e-Learning platforms.

Figure 2*:* **Abstract of the Third SSYS 2014 forum Topic 'Human Factor during the Impact of Natural Disaster:**
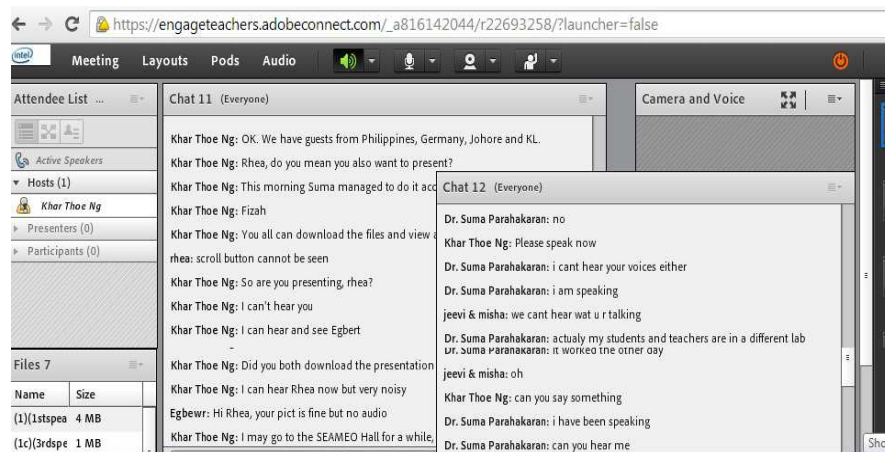**Reflective Perspectives' (Parahakaran, 2014) Delivered Using ODL Mode**

Figure 3: Printscreen of the Chat Messages with National and International Guests during Webinar trial Run Session (Chat 11) (27/2/2014) and SSYS Forum (Chat 12) (7/3/2014)
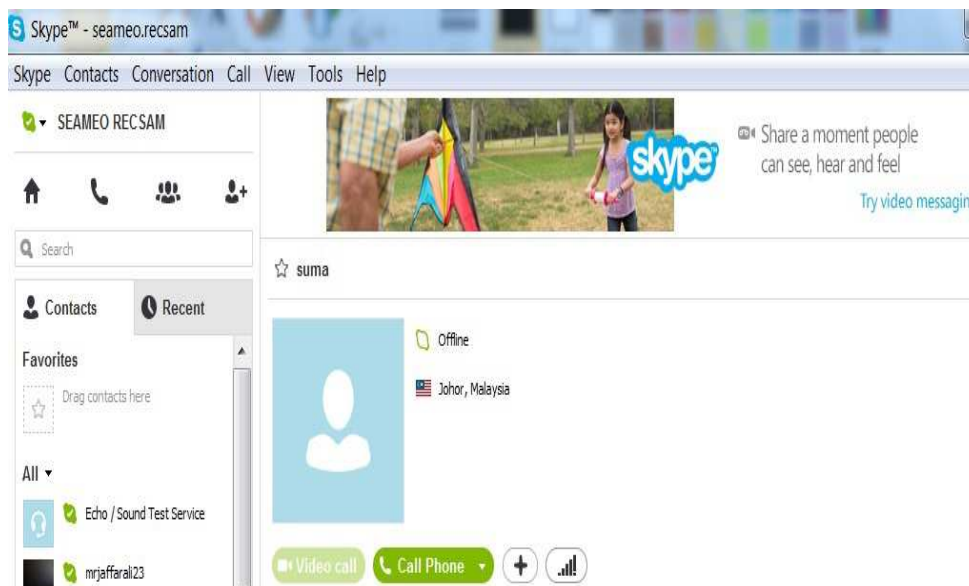

Figure 4: Photos Taken on Video Conferencing Activities during SSYS Forum (7/3/2014) and Print Screen of Skype Account that was Used Later

This forum was held from 8.15 a.m. to 10.15 a.m. (Malaysian time) Friday of 7th March 2014, the last day of 9th SSYS congress (http://www. recsam.edu.my/ssys). A trial run session was conducted on Thursday of 27/2 from 8 a.m. to 7 p.m. (Malaysian time) with invitation for all to visit the meeting room. Instruction was given to the guest to go to the URL of Intel webinar meeting room: URL: https://engageteachers. adobeconnect.com/_a816142044/r22693258/, then clicked 'Guest' and Enter the webinar meeting room using their own ID/Name and wait for the host to invite them inside the meeting room with marking of attendance by typing something in the Chat box. Overseas participants were also guided with the checking of time zone between several cities using Time Difference Calculator: http://www.timeanddate.com/worldclock/ converter.html?iso=20140307T08&p1=1228&p2=83&more=4

Feedback from Open-Ended Survey Findings

ATUTESL was analyzed quantitatively and qualitatively with some verbatim responses extracted from 'Comments' column of open-ended responses. Generally the interviewees (3 teachers and 6 student delegates) responded that they used e-learning and m-learning tools quite a lot as shown in the following verbatim responses:

We use e-learning tools e.g. Internet (x1), netbook, smart phone, laptop (x2) often; We also use e-forum (x2), webinar (x2), skype (x2), e-book (x2) and m-learning tools e.g. smart phone (x2), tablet (x2), netbook, laptop, i-pad (x2) quite a lot.

(Female Filipino, Male Malaysian and Chinese teachers, response on 7th March 2014)

But we use e-forum, webinar, e-book, netbook, i-pad and skype the least.

(Male Chinese teacher, survey open-ended response on 7th March 2014)

We use e-learning tools such as Internet, skype, wikipedia and m-learning tools such as netbook, laptop, i-pad very often; but not so much for e-learning tools such as e-forum, webinar, e-book, and m-learning tools such as smart phone and tablet.

(Male Thailand student, survey open-ended response on 7th March 2014)

The interviewees also expressed their positive values/attitude on blended learning tools to enhance awareness in sustainable living as reflected in the following excerpts:

We found these things are very help to my understanding…should be more accessible. Intel is very helpful. Very good! Amazing! Hooray! The Internet is so… insightful.

(Male Filipino student 1 and 2, survey responses on 7th March 2014)

We found that technology helps to make learning more effective and fun. I think these tools can enhance people living through technology, e.g. we can connect the world together by the Internet and exchange our knowledge.

(Female Singaporean and Male Thailand students, responses on 7th March 2014)

CONCLUSIONS

This study explore the Centre's recent initiative to connect the world with biennially held event SSYS congress through Open, Distance and e-Learning platforms.

Challenges and Opportunities of E-platforms to Promote Values Education

Apart from showcasing the blended mode of organizing SSYS congress incorporating values-based education in line with the congress theme '*Disaster Risk Reduction for Sustainable Development*' despite various constraints faced, the following are some challenges and opportunities identified during the implementation of event:

- Several types of digital learning and video conferencing tools should be explored on the respective strengths and weaknesses as contingency plans in the events of constraints faced. For example, some technical errors were faced during this SSYS to use webinar to broadcast the presentation by the second author from far to the delegates attending the forum at Centre and to those outside the Centre in other countries. Luckily skype was able to be set up to solve problems, hence the event was conducted successfully and according to the schedule.

- Since the interviewees of three Generation X teachers and six Generation Y student delegates showed positive attitudes generally towards the use of digital e-/ m-learning tools to promote values-based awareness, thinking and life skills for sustainable living, such types of tools should be implemented more often to promote EFA through ODL mode.

Research Implications, Limitations and Future Direction

In this study, the idea of using digital tools to connect SSYS project-based programme with the world was evolved as a result of the researchers' previous experiences involving in ODL and various blended learning programmes such as 'Science across the World' (SAW) and HVWSHE. An implication is that in order to facilitate successful ODL activities despite various constraints, more strategic planning should be made to deal with key questions such as 'What else could be done, for whom to do and how to excel', perhaps to consider including broader field of research and evaluation towards building new knowledge and high quality services (Armstrong, 1986; Cohen, 2004). The researchers should reflect on the lessons learnt to improve the delivery/ implementation of programmes especially the technical aspects of ODL.

The analysis of data collected from surveys and interviews also revealed the research implications that are worth pondering. Many stakeholders who were interviewed felt that they were motivated to use the digital tools to promote sustainable living and learned tremendously from their experience involving in SSYS that promote values-based ESD related programmes as evidenced in their research projects presented in the congress. In fact, SSYS congresses generated many creative, values-based ESD related project ideas. Most of the student delegates involved in the previous congres-ses were found to have ventured into science and technology related careers e.g. engineers, medical professionals and research scientists, some of whom are still in touch with the researchers as reported by Ng (2002) and Ng (2005). Hence the future areas that could be exploited may include the opportunities for directions, challenges to support the advancement of youth development in values-based ESD related programmes through ODL approaches. New domains of partnership that provide a repository for knowledge areas required to address the needs from SEAMEO perspectives for regional collaboration in youth development should be explored.

More follow-up activities should be done to analyze the quantitative and qualitative findings of the surveys being administered during the 9th SSYS congress (3rd to 7th March 2014) to explore the delegates' inclination and attitudes towards the use of technology to enhance sustainable living. More Continuing Programme Development (CPD) programmes should also be included to promote the teaching and learning of thinking skills, technology skills and life (i.e. work/entrepreneurial and survival) skills that are required for Borderless School project as an area identified under the

vision of Golden SEAMEO. Towards achieving the aspiring goals of 'building sustainable campus with creative minds through networking and human resource development' especially through SSYS as reported by Ng et al. (2014), Ng, Aligaen, Thien and Ab Bakar (2014), curriculum writing/editing workshops were conducted (as have been completed from 19th to 20th June and targetted to be completed from 1st to 3rd October 2014) to prepare Open Educational Resources (OER) with sharing of exemplars to be disseminated on-line. ODL platforms will be used including mainly through the '**S**outh **E**ast **A**sia **R**egional **C**apacity-enhancing **H**ub' (SEARCH) to promote sustainable knowledge management system (Ng, 2010; 2012a). The SSYS project output being archived in the e-forum of '**S**cience **P**roject/problem/programme-based **A**ctivities in**C**orporating **E**xperiment **MAN**agement' (SP3ACEMAN)(a subportal linked to SEARCH) also serves as rich source of information for the sharing of exemplary practices and dissemination of values-based projects through investigative research as reported by Mangao and Ng (2014), Ng (2012b), Ng (2013), Ng and Baharum (2013). The scientific projects completed by youth may feature the dynamics of values education using blended mode, with training for better understanding of sustainability and enhance public awareness with knowledge, skills, values required for quality living.

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